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Ephemeris for Physical Observations of

Greenwich Noon.	P.	L−O.	B.	Λ−L.	*B.*	Q.	E.	Light Time.
1898.	°	°	°	°	°	°	°	m
June 27	321·16	143·13	−14·98	−35·17	−24·13	252·22	34·29	14·96
29	321·20	144·51	14·45	35·22	23·96	252·67	34·49	14·89
July 1	321·26	145·88	13·92	35·26	23·78	253·13	34·70	14·83
3	321·34	147·25	13·39	35·31	23·59	253·59	34·91	14·76
5	321·45	148·60	12·85	35·35	23·40	254·05	35·12	14·69
7	321·58	149·94	−12·31	−35·39	−23·19	254·51	35·32	14·61
9	321·74	151·28	11·76	35·44	22·97	254·98	35·53	14·54
11	321·92	152·60	11·21	35·47	22·74	255·47	35·73	14·47
13	322·13	153·92	10·66	35·50	22·50	255·96	35·93	14·40
15	322·36	155·23	10·10	35·53	22·25	256·46	36·12	14·33
17	322·61	156·53	−9·54	−35·56	−21·99	256·97	36·31	14·25
19	322·88	157·81	8·98	35·59	21·72	257·49	36·50	14·18
21	323·16	159·08	8·41	35·61	21·44	258·01	36·70	14·11
23	323·46	160·35	7·84	35·64	21·16	258·54	36·89	14·03
25	323·79	161·61	7·27	35·67	20·87	259·08	37·08	13·96
27	324·14	162·86	−6·70	−35·71	−20·57	259·62	37·26	13·88
29	324·51	164·10	6·14	35·74	20·26	260·16	37·43	13·80
31	324·90	165·33	5·58	35·77	19·94	260·71	37·61	13·71
Aug. 2	325·31	166·56	5·01	35·80	19·62	261·26	37·78	13·63
4	325·73	167·78	4·44	35·83	19·29	261·82	37·95	13·55
6	326·17	168·98	−3·87	−35·86	−18·96	262·38	38·13	13·47
8	326·63	170·18	3·31	35·89	18·62	262·94	38·29	13·39
10	327·10	171·38	2·75	35·92	18·27	263·50	38·45	13·30
12	327·58	172·57	2·19	35·95	17·91	264·06	38·61	13·21
14	328·08	173·76	1·63	35·99	17·55	264·62	38·76	13·12
16	328·60	174·94	−1·07	−36·03	−17·19	265·18	38·91	13·03
18	329·12	176·11	−0·52	36·07	16·82	265·74	39·06	12·94
20	329·65	177·27	+0·03	36·11	16·45	266·30	39·20	12·85
22	330·20	178·42	0·57	36·15	16·07	266·86	39·34	12·76
24	330·76	179·56	1·11	36·18	15·69	267·42	39·47	12·66
26	331·32	180·69	1·64	36·21	15·30	267·98	39·60	12·57
28	331·89	181·82	2·17	36·25	14·91	268·53	39·72	12·47
30	332·47	182·94	+2·70	−36·29	−14·51	269·08	39·84	12·38

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Mars, 1898. By A. C. D. Crommelin.

Greenwich Noon.		Appar. Diam.	Defect of Illumination. q	Central Meridian. ω_0	Passage of Zero Meridian.			
1898.		"	"	°	h	m	h	m
June	27	5·33	0·46	4·53	...	...	23	41
	29	5·35	0·46	344·95	1	2	0	22
July	1	5·37	0·47	325·38	2	22	1	42
	3	5·39	0·48	305·82	3	42	3	2
	5	5·42	0·49	286·27	5	3	4	23
	7	5·46	0·50	266·73	6	23	5	43
	9	5·49	0·51	247·20	7	43	7	3
	11	5·52	0·51	227·67	9	4	8	23
	13	5·55	0·52	208·15	10	24	9	44
	15	5·58	0·53	188·64	11	44	11	4
	17	5·61	0·54	169·14	13	5	12	25
	19	5·65	0·55	149·65	14	25	13	45
	21	5·68	0·56	130·17	15	45	15	5
	23	5·71	0·57	110·71	17	5	16	25
	25	5·74	0·58	91·26	18	25	17	45
	27	5·77	0·59	71·82	19	45	19	5
	29	5·80	0·59	52·39	21	5	20	25
	31	5·83	0·60	32·97	22	24	21	45
Aug.	2	5·87	0·61	13·55	23	44	23	4
	4	5·91	0·62	354·13	0	24	...	...
	6	5·95	0·63	334·72	1	44	1	4
	8	5·98	0·64	315·32	3	4	2	24
	10	6·02	0·65	295·93	4	23	3	44
	12	6·06	0·66	276·54	5	43	5	3
	14	6·10	0·67	257·16	7	2	6	22
	16	6·14	0·68	237·79	8	22	7	42
	18	6·18	0·69	218·43	9	41	9	2
	20	6·22	0·70	199·08	11	1	10	21
	22	6·27	0·71	179·74	12	21	11	41
	24	6·31	0·72	160·40	13	40	13	0
	26	6·36	0·73	141·07	14	59	14	20
	28	6·40	0·74	121·75	16	19	15	39
	30	6·45	0·75	102·44	17	38	16	58

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Greenwich Noon.	P.	L−O.	B.	A−L.	*B.*	Q.	E.	Light Time.
1898.	°	°	°	°	°	°	°	m
Sept. 1	333·06	184·06	+3·22	−36·33	−14·11	269·62	39·96	12·28
3	333·66	185·17	3·73	36·37	13·71	270·16	40·07	12·18
5	334·26	186·27	4·24	36·41	13·30	270·70	40·18	12·08
7	334·87	187·37	4·75	36·46	12·89	271·24	40·28	11·98
9	335·49	188·47	+5·25	−36·52	−12·48	271·77	40·37	11·88
11	336·11	189·55	5·73	36·56	12·07	272·30	40·46	11·78
13	336·73	190·63	6·20	36·61	11·65	272·81	40·54	11·67
15	337·36	191·70	6·67	36·65	11·23	273·32	40·61	11·56
17	337·99	192·76	7·13	36·69	10·81	273·82	40·67	11·46
19	338·63	193·81	+ 7·59	−36·73	−10·39	274·31	40·73	11·35
21	339·27	194·86	8·03	36·78	9·97	274·80	40·78	11·24
23	339·90	195·90	8·47	36·82	9·55	275·28	40·82	11·13
25	340·52	196·93	8·90	36·85	9·12	275·75	40·85	11·02
27	341·15	197·94	9·32	36·87	8·69	276·21	40·88	10·91
29	341·78	198·94	+ 9·73	−36·89	− 8·26	276·65	40·89	10·80
Oct. 1	342·40	199·94	10·13	36·91	7·83	277·08	40·89	10·68
3	343·02	200·93	10·52	36·93	7·39	277·50	40·88	10·57
5	343·63	201·91	10·91	36·94	6·96	277·92	40·86	10·45
7	344·23	202·87	11·28	36·94	6·53	278·33	40·83	10·33
9	344·84	203·82	+11·64	−36·93	− 6·10	278·73	40·79	10·21
11	345·45	204·77	12·00	36·92	5·67	279·12	40·74	10·09
13	346·05	205·70	12·34	36·90	5·23	279·49	40·68	9·97
15	346·64	206·61	12·67	36·87	4·80	279·85	40·59	9·85
17	347·22	207·51	12·98	36·83	4·37	280·19	40·49	9·72
19	347·79	208·40	+13·28	−36·79	− 3·93	280·52	40·38	9·60
21	348·35	209·27	13·58	36·73	3·50	280·84	40·25	9·48
23	348·90	210·12	13·86	36·66	3·06	281·15	40·10	9·35
25	349·45	210·96	14·13	36·57	2·63	281·44	39·93	9·23
27	349·98	211·78	14·38	36·47	2·20	281·71	39·74	9·11
29	350·49	212·56	+14·62	−36·33	− 1·77	281·97	39·53	8·99
31	350·98	213·31	14·85	36·17	1·35	282·21	39·30	8·86
Nov. 2	351·46	214·04	15·07	35·99	0·93	282·45	39·04	8·73
4	351·92	214·74	15·28	35·79	0·50	282.67	38·77	8·61
6	352·35	215·42	15·44	35·57	0·07	282·87	38·48	8·48
8	352·76	216·06	+15·60	−35·31	+ 0·35	283·06	38·16	8·35
10	353·14	216·67	+15·74	−35·03	+ 0·77	283·24	37·81	8·23

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Greenwich Noon. 1898.		Appar. Diam. ″	Defect of Illumination. q ″	Central Meridian. ω_0 °	Passage of Zero Meridian. h	m	h	m
Sept.	1	6·50	0·76	83·13	18	58	18	18
	3	6·56	0·77	63·83	20	17	19	38
	5	6·61	0·78	44·53	21	37	20	57
	7	6·66	0·79	25·24	22	57	22	17
	9	6·72	0·80	5·95	...	...	23	36
	11	6·78	0·81	346·67	0	55	0	16
	13	6·84	0·82	327·40	2	14	1	35
	15	6·90	0·83	308·14	3	33	2	54
	17	6·97	0·84	288·89	4	52	4	13
	19	7·04	0·85	269·65	6	11	5	31
	21	7·12	0·86	250·42	7	30	6	50
	23	7·20	0·87	231·19	8	49	8	9
	25	7·27	0·89	211·97	10	8	9	28
	27	7·34	0·90	192·76	11	27	10	47
	29	7·41	0·91	173·56	12	45	12	6
Oct.	1	7·50	0·92	154·37	14	5	13	25
	3	7·57	0·93	135·20	15	23	14	44
	5	7·64	0·93	116·04	16	42	16	2
	7	7·72	0·94	96·89	18	0	17	21
	9	7·81	0·95	77·75	19	19	18	40
	11	7·91	0·96	58·62	20	38	19	59
	13	8·02	0·97	39·51	21	57	21	18
	15	8·12	0·97	20·41	23	16	22	36
	17	8·23	0·98	1·32	...	...	23	55
	19	8·33	0·99	342·24	1	13	0	34
	21	8·43	1·00	323·18	2	31	1	52
	23	8·54	1·00	304·14	3	49	3	10
	25	8·65	1·01	285·13	5	7	4	28
	27	8·77	1·01	266·15	6	25	5	46
	29	8·89	1·01	247·18	7	43	7	4
	31	9·02	1·02	228·23	9	1	8	22
Nov.	2	9·15	1·02	209·31	10	19	9	40
	4	9·29	1·02	190·42	11	37	10	58
	6	9·42	1·02	171·56	12	55	12	16
	8	9·56	1·02	152·73	14	12	13	33
	10	9·70	1·02	133·94	15	29	14	51

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The ephemeris has been constructed with the same constants as those employed by Mr. Marth in his ephemeris for the last opposition (*Monthly Notices*, lvi. 7, p. 394). The position of the north pole of *Mars* for 1898·0 is taken as R.A. 317°·15, N.P.D. 37°·43, this being the value deduced by Struve from observations of the satellites : it differs considerably from values deduced from observations of markings on the planet. The following are the three most recent determinations by this method, all reduced to 1898·0 :—

	R.A.	N.P.D.	
Schiaparelli	318°·27	36°·31	Mean value R.A. 318°·35, N.P.D. 36°·37.
Lohse, 1883	318°·34	36°·63	
Lohse, 1893	318°·45	36°·16	

I shall be glad of the opinions of observers as to the advisability of continuing to use Struve's value, or substituting the mean of the other three.

P denotes the position-angle of the axis of *Mars*, L − O + 180° the longitude of the Earth referred to the plane of *Mars'* equator, and reckoned from O, the point of the vernal equinox of *Mars'* northern hemisphere, Λ − O + 180° the corresponding quantity for the Sun, B, *B* the latitudes of the Earth and Sun reckoned from the plane of *Mars'* equator, Q the position-angle of the greatest defect of illumination, *q* the amount of the greatest defect of illumination, E the areocentric angle between Earth and Sun.

The diameter of the planet at distance unity is assumed (as before) to be 9″·60, that used in the *Nautical Almanac* being 9″·36.

The zero meridian and period of rotation have been carried on unchanged from Mr. Marth's last ephemeris, the assumed sidereal rotation in 24 hours being 350°·89202.

The times of passage of the zero meridian are given approximately. Where greater accuracy is required, the time may be deduced by interpolating between two successive tabulated values of the central meridian at noon.

The winter solstice of *Mars'* northern hemisphere occurred 1898 May $31^{\mathrm{d}}\cdot7$, and the spring equinox occurs 1898 November $6^{\mathrm{d}}\cdot3$.

Benvenue, Ulundi Road, Blackheath, S.E.:
1898 *June* 20.

Erratum in Mr. Anderson's paper, MONTHLY NOTICES, vol. lviii. p. 380, note to observation of March 8 :—

For ζ *Tauri* read ξ *Tauri.*